Remarks

Claims 1-58 are pending. Claims 1, 5-7, 13, 24, 34 and 42-58 are amended to more particularly point out and distinctly claim Applicants' invention.

The disclosure was objected to for informalities. As amended, the Specification is believed to have overcome the Examiner's objections.

Claims 2, 5-7 and 51 were objected to for informalities. As amended, these claims are believed to have overcome the Examiner's objections.

The Examiner rejected Claims 1-7, 9-18, 20-29 and 31-41 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,298,083 to Westcott et al. ("Westcott"), in view of U.S. Patent No. 6,563,861 to Krasny et al. ("Krasny"). Regarding Claims 1, 13 and 24, the Examiner states:

> 7. Regarding claims 1, 13 and 24, Westcott et al. disclose in Fig. 8, a spread spectrum detector where a signal is received, a correlator 73 generates a plurality of correlation values based on the signal and a code generated by reference code generator 77, and an accumulation block 74, shown in detail in Fig. 12, includes multipliers 110 generating a plurality of complex second correlation values from the first correlation values by combining the first correlation values with a mixing signal MS output by generators 111 via a look-up table using the value PHASE which represents a basic Doppler offset, and the second correlation values are accumulated in stages 114 and 117 to provide a third correlation value that indicates a degree of correspondence of the code with the signal (see col. 13, line 1 to col. 14, line 17).
>
> 8. Westcott et al. do not disclose the use of a fast Fourier transform to generate the second correlation values.
>
> 9. Krasny et al. teach the use of a fast Fourier transform for performing correlation in the frequency domain (col. 5, line 65 to col. 6, line 9). Further, processing signals in the time domain or in the frequency domain by employing an FFT are well-recognized art equivalents.

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> 10. Thus, it would have been obvious to one of ordinary skill in the art to use the teaching of Krasny et al. to use a fast Fourier transform to perform correlation in the frequency domain in the spread spectrum detector of Westcott et al. as a matter of design choice.

Applicants respectfully traverse the Examiner's rejection. Claim 1, for example, recites:

> 1. (Currently amended) A method for a spread spectrum detector, comprising the steps of:
>
> receiving a spread spectrum modulated signal having a Doppler shift error imposed by movement between a signal source and a receiver;
>
> producing a plurality of complex first correlation values based upon the signal, a doppler shift, and a code;
>
> generating a plurality of complex second correlation values respectively from the first correlation values using a fast fourier transform (FFT), wherein generating includes combining a correction for the Doppler shift error with each of the first correlation values to produce the second correlation values; and
>
> integrating the second correlation values to derive a complex third correlation value that indicates a degree of correspondence of the code with the signal.
>
> (emphasis added)

These limitations are disclosed or suggested by neither Westcott nor Krasny. Westcott's col. 13, line 1 to col. 14, line 17, on which the Examiner relies for his rejection, merely recites the process of obtaining a set of correlation values based on a set of hypothesized carrier Doppler shifts. Westcott neither discloses nor suggests applying a correction to the Doppler shift error to the first correlation values to achieve the second set of correlation values. Further, Krasny discloses a "Doppler spread estimation system" which also neither discloses nor suggests the above-quoted limitations. Thus, Claim 1 and its dependent Claims 2-7 and 9-12 are allowable over the combined teachings of Westcott and Krasny. Claims 13 and 24 each recite limitations to a Doppler shift in the first correlation

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values and correction to Doppler shift error in the second correlation values, substantially the same as those of Claim 13 quoted above. Thus, Claims 13, 24 and 34 and their respective dependent Claims 14-18, 20-23, 25-29, 31-33 and 35-41 are each allowable over the combined teachings of Westcott and Krasny. Accordingly, Applicants respectfully request reconsideration and allowance of Claims 1-7, 9-18, 20-29 and 31-41.

The Examiner rejected Claims 42 and 43 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,825,327 to Krasner ("Krasner '327"), in view of Westcott and Krasny. The Examiner states:

> 31. Krasner `327 discloses a GPS receiver including all of the limitations of claims 42 and 43 (see `327 Patent, claims 1 and 30) except for a multiplier for producing first correlation values using the signal and a code, a phase shifter for generating second correlation values from the first correlation values using an FFT, and an integrator for deriving a third correlation value.
>
> 32. Westcott et al. disclose in Fig. 8, a spread spectrum detector comprising a correlator 73 for generating a plurality of correlation values based on a signal and a code generated by reference code generator 77, and an accumulation block 74 having multipliers 110 for generating a plurality of complex second correlation values from the first correlation values by combining the first correlation values with a mixing signal MS output by generators 111 via a look-up table using the value PHASE which represents a basic Doppler offset, and the second correlation values are accumulated in stages 114 and 117 to provide a third correlation value indicating a degree of correspondence of the code with the signal (col. 13, line 1 to col. 14, line 17).
>
> 33. It would have been obvious to one of ordinary skill in the art to use the detector of Westcott et al. in the receiver of Krasner to compensate for Doppler shift.
>
> 34. In addition, Krasny et al. teach the use of an FFT for performing correlation in the frequency domain (col. 5, line 65 to col. 6, line 9). Further, processing signals in the time domain or in the frequency domain by employing an FFT are well-recognized art equivalents.
>
> 35. Thus, it would have been obvious to one of ordinary skill in the art to use the teaching of Krasny et al. to use a fast Fourier transform to perform correlation in the frequency domain in the spread spectrum detector of Krasner and Westcott et al. as a matter of design choice.

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Applicant respectfully traverses the Examiner's rejection. As amended, Claim 42 recites, in pertinent :

> 42. (currently amended) A GPS receiver, comprising:
>
> * * *
>
> a receiver configured to receive a spread spectrum modulated signal having a Doppler shift error imposed by movement between a signal source and a receiver;
>
> a multiplier configured to produce a plurality of complex first correlation values based upon the signal, a Doppler shift, and a code;
>
> a phase shifter configured to generate a plurality of complex second correlation values respectively from the first correlation values using a fast fourier transform (FFT), wherein generating includes combining a correction for the Doppler shift error with each of the first correlation values to produce the second correlation values; and
>
> an integrator configured to integrate the second correlation values to derive a third correlation value that indicates a degree of correspondence of the code with the signal.
>
> (emphasis added)

The above-quoted limitations are disclosed or suggested by neither Krasny nor Westcott. As the Examiner recognizes, Krasny teaches neither the first correlation values nor the second correlation values. As explained above, Westcott merely recites the process of obtaining a set of correlation values based on a set of hypothesized carrier Doppler shifts. Westcott neither discloses nor suggests applying a correction to the Doppler shift error to the first correlation values to achieve the second set of correlation values. Thus, the combined teachings of Krasny and Westcott neither disclose nor suggest Applicants' Claim 42. Claim 43 also include substantially the above-quoted limitations. Thus, both Claims 42 and 43 are

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allowable over Krasny and Westcott, individually or in any combination. Accordingly, reconsideration and allowance of Claims 42 and 43 are therefore requested.

The Examiner rejected Claims 44-55 and 58 as unpatentable over various "Krasner Patents" (i.e., U.S. Patents 5,825327, 5,945,944, 5,831,574, 5,884,214, 5,874,914, 6,016,119, 5,781,156, 5,841,396 and 6,002,363) in view of Krasny and Westcott. In each rejection the Examiner states that the corresponding one of the Krasner Patents fail to teach "producing first correlation values using the signal and a code, generating second correlation values from the first correlation values using an FFT, and combining the second correlation values to generate a third correlation value."

Applicants traverse the Examiner's rejections. Claim 44-55 and 58 each include substantially the following pertinent limitations:

* * *

> producing a plurality of complex first correlation values based upon a signal, a Doppler shift, and a code;
>
> generating a plurality of complex second correlation values respectively from the first correlation values using a fast fourier transform (FFT), wherein generating includes combining a correction for a Doppler shift error with each of the first correlation values to produce the second correlation values; and
>
> combining the second correlation values to derive a complex third correlation value that indicates a degree of correspondence of the code with the signal.
>
> (emphasis added)

Thus, as explained above, these limitations are disclosed or suggested by neither Krasny nor Westcott. Thus, Claims 44-55 and 58 are each allowable over the combined teachings of any of the Krasner Patents, Krasny and Westcott, individually and in combination. Reconsideration and allowance of Claims 44-55 and 58 are therefore requested.

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The Examiner rejected Claims 56 and 57 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,999,124 to Sheynblat ("Sheynblat"), in view of Westcott and Krasny. With respect to each of Claims 56 and 57, the Examiner states:

> 104. Sheynblat '124 discloses a method for processing position information with all of the limitations of [claim 56 or 57] (see '124 Patent, claim 1) except producing first correlation values using the signal and a code, generating second correlation values from the first correlation values using an FFT, and combining the second correlation values to generate a third correlation value.

Applicants respectfully traverse the Examiner's rejections. Claim 56 and 57 each include substantially the following pertinent limitations:

> * * *
>
> producing a plurality of complex first correlation values based upon a signal, a Doppler shift, and a code;
>
> generating a plurality of complex second correlation values respectively from the first correlation values using a fast fourier transform (FFT), wherein generating includes combining a correction for a Doppler shift error with each of the first correlation values to produce the second correlation values; and
>
> combining the second correlation values to derive a complex third correlation value that indicates a degree of correspondence of the code with the signal.
>
> (emphasis added)

Thus, as explained above, these limitations are disclosed or suggested by neither Krasny nor Westcott. Thus, Claims 56 and 57 are each allowable over the combined teachings of Sheynblat, Krasny and Westcott, individually and in combination. Reconsideration and allowance of Claims 56 and 57 are therefore requested.

Therefore, for the reasons stated above, all pending claims (i.e., Claims 1-58) are believed allowable. Their allowance is therefore requested. If the Examiner has any question

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regarding the above, the Examiner is respectfully requested to telephone the undersigned Attorney for Applicant at (408)-392-9250.

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on October 8, 2004.

Attorney for Applicant(s) — Date of Signature

Respectfully submitted,

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